

Newer Method.



NCR Corporation

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INTRA CORPORATION

\* Try old way first

6805  
1B

FOR INFORMATION ONLY

NCR - 785  
COLOR CODE BAR READER

Investigation into the high rate of service calls being made for readjustment of the C-785 has proven the present adjustment procedure inadequate. A more precise method has been devised which requires the use of a special wand holder. This new procedure allows a more accurate setting of the gain and insures proper operating parameters of the amplifier circuits.

Use of this procedure allows the field engineer to better determine when components must be changed to maintain reliable operation and should limit the number of service and Training Manual (MS-854).

The purpose of this procedure is to adjust the gain of the red and infrared amplifier so that their output amplitudes (peak to peak) are set to the optimum level and are as close to equal as possible.

The adjustment procedures and equipment required to perform the adjustments are as follows:

EQUIPMENT REQUIRED

1. VOM, Triplett 310 or equivalent
2. Capacitor, 0.1 MFD/50V
3. Holder, Color Bar Reader, Part #603-9002961
4. Color Bar Reader Set-up Card, located on the under side of the upper cover of the C-785, Part #385-0001002.
5. Parent Terminal, for power.
6. Alligator Clips, for easy connection of the capacitor to the meter lead.

ADJUSTMENT PROCEDURE

Pre-Adjustment Check

Make sure that the polarity of the "Y" block assembly is observed. Units are

adjusted in the factory with the screw head in the "Y" block assembly facing up (away from component side of the optical probe plug-in board).

Any time a probe is replaced the test procedure should be followed to insure reliable performance.

Check the probe nose for wear and replace or clean if necessary.

On all optical Decode Plug-in Boards covered with a conformal coating only (refer to FES TSB 0340-747-26/785-02-1975) resistor R33 should be changed to 4.7 ohms to increase gain on IR channel.

Check the quiescent level before starting the adjustment procedure.

Set the V.O.M. to the 12 VDC scale and connect the negative lead to ground. With the wand facing off into space (zero reflectance) verify that the D.C. voltage level at the red channel output TP4 (red test point) is between + 6.8 and + 8.5 VDC.

Check the infrared channel output in the same manner using TP3 (yellow test point). The D.C. voltage level should be between + 6.8 and +8.5 VDC.

If either voltage is out of limits make sure that level adjustment pots R6 (red) or R5 (infrared) are not turned fully clockwise (zero gain).

If these conditions cannot be met change the optical probe plug-in board and recheck.

#### RED CHANNEL GAIN ADJUSTMENT

Set the V.O.M. to the 12 VAC scale and place the 0.1 MFD capacitor in series with one of the meter leads. Connect one of the meter leads to the red channel output TP4 (red test point) and connect the other lead to logic ground.

Place the wand into the Color Bar Reader Holder so that the tip will make light contact with the test media (Color Bar Reader Set Up Card). Use the black/white bar pattern on the test media. When making the adjustment, sweep the probe back and forth with the path of the tip perpendicular to the black/white bars. The holder is intended to hold the wand at a 15° angle from perpendicular-the optimum reading angle.

When scanning the test media, adjust the red gain pot (R6) to obtain 4.0 volts + zero minus 1.0 VRMS.

#### INFRARED CHANNEL GAIN ADJUSTMENT

The infrared channel is adjusted in the same manner as the red channel.

The infrared channel test point is TP3 (yellow test point) and infrared gain adjusting pot is R5.

#### RECHECK

Recheck the red channel following any adjustment of the infrared channel because there is some interaction between the two channels. The object is to maintain both

channels at their peak efficiency (4.0 VRMS), but more importantly, to balance them at a level no lower than 3.0 VRMS. This can be accomplished by repeating the gain adjustments until the optimum adjustment is achieved in the red channel, and then balancing the infrared channel to it.

Any reading below 3.0 VRMS indicates a degradation of components in the unit and will limit the units reliability.

If gain adjustment cannot be held within limits (3 to 4 VRMS), replacement of the optical probe, optical lamp, or optical probe plug-in board will be necessary.

#### NEGATIVE PEAK DETECTION

Remove the 0.1 capacitor from the meter lead and set the V.O.M. to the minus (-) 12 VDC scale. Monitor the DC voltage level at TPI (white test point).

As the scan of the black/white bar pattern commences, the DC voltage level should change from a positive level to negative  $4.5 \text{ VDC} \pm 2 \text{ volts}$ .

The probe should face off into space for a few seconds prior to the start of a scan and the reading should be taken immediately after the scan begins.

If these limits ( $4.5 \pm 2 \text{ VDC}$ ) are not met, replacement of the probe plug-in board will be necessary.

#### NULL ADJUSTMENT

Place the 0.1 MFD capacitor in series with one of the meter leads and set the V.O.M. to the 3 VAC scale. Connect one meter lead to TP2 (green test point) and connect the other lead to logic ground.

Scan the black/white bar pattern, as was done for the gain adjustment, and adjust R6 (red channel gain pot) to obtain as little deflection as possible on the meter. It should be possible to obtain less than .5 VRMS deflection.

A higher reading than this indicates excessive noise in the circuitry and potentially poor reliability. Replacement of the probe plug-in board is advised.

#### TESTING

While hand-holding the wand (do not use test holder) verify that each of 10 good scans result in 10 good reads on each tag, 5 in each direction. Media known to be good, such as a customer tag or a tag on the left side of the test card, may be used for this test.

A good scan is considered to be one which passes smoothly over the entire length of approximately 30 ips (as nearly as can be estimated). The wand tip should be in light contact with the tag and the wand angle should be approximately  $15^\circ$  from perpendicular.

Carefully scan each of the 9 marginal tags located in the lower right section of the test card and verify that 5 out of 10 scans on each tag result in good reads. It may be necessary to make several preliminary scans to find the appropriate wand angle, which is especially critical for the marginal tags. Once found, it should be possible to obtain 5 good reads from 10 good scans.

NOTE: Since these tags are marginal, every effort should be made to scan with a smooth, continuous motion.

Scan each of the 6 logical error tags located in the upper right section of the test card. Verify that each one results in an error tone from the parent unit.

#### RELIABILITY ENHANCEMENTS

A new style heavy-duty optional probe is now available from Peachtree City. This probe is much more durable and should extend the life of the optics considerably. The part number of the new style probe is 189-1004731.

A new style stainless steel probe nose, part #189-1014980 is available. This probe nose will last much longer than the present style.

Reliability improvements have been incorporated in the optical Decode plug-in board. The new board, part #189-1015923 has all the new improvements.



P. A. Carselle - Director  
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## SECTION F MAINTENANCE PROCEDURES

### OBJECTIVES: *Adjustments*

*This section describes the maintenance procedures for the C-785, including the pen decode adjustment procedure.*

### DAILY MAINTENANCE

Daily maintenance is performed by the operator. The procedure consists of removing the tip from the optics probe and cleaning it. The operator should be instructed to use a soft cloth. The operator should not clean the probe lens.

### FOUR MONTH MAINTENANCE

The 4-month maintenance is performed by the Technical Services Representative (TSR). The following procedure lists the steps to be taken and the sequence in which the procedure must be performed.

1. Check the general condition of the electronic package and the optics bundle. Replace damaged components as required.
2. Remove the top housing from the electronics package. Remove a screw from each side of the bottom housing and lift the chassis up. Turn the chassis over so the component side of the Optical Probe Decode Board is facing up.

Remove the tip from the optics probe. Check the tip for excessive wear by attempting to pass it through the built-in gauge in the side of the chassis. Replace the tip if it passes through the gauge. The tip should also be checked for severe nonuniform wear. Replace the tip if excessively worn in one spot even if the tip does not pass through the gauge.

3. Clean the exposed area of the probe lens with a soft cloth or "Q" tip. Care must be taken not to scratch the lens.
4. Check the input voltages for proper levels. If the levels are not correct, check the connections between the C-785 and the parent machine.
5. Check the analog signals on the Optical Probe Decode Board for proper levels (Refer to Pen Decode Alignment Procedure). If the signals cannot be adjusted to acceptable levels, replace the optics bundle and probe and repeat the alignment procedure.
6. Check the unit for proper reading of marginal tags. The tags are located on the under side of the upper cover.
7. Check the unit for error detection of code error tags. These tags are also located on the upper cover.

### EIGHT MONTH MAINTENANCE

The 8-month procedure is performed by the TSR. This procedure is the same as the 4-month procedure except at eight months the optics lamp is replaced. The sequence of the procedure is as follows.

1. Complete steps one through four of the 4-month maintenance procedure.
2. Replace the optics lamp (refer to Replacement Procedures).
3. Complete steps five through seven of the 4-month maintenance procedure.

### ADJUSTMENT PROCEDURE

There is only one adjustment in the C-785. This adjustment is the Pen Decode Alignment. The purpose of this procedure is to adjust the gain of the red and infrared amplifiers so that their output amplitudes (peak to peak) are as close to equal as possible. The adjustment procedure and the equipment required to perform the adjustment are as follows:

1. Equipment required:
  - a. VOM (Triplett 310 or equivalent)
  - b. 0.1  $\mu$ f capacitor
  - c. A black and white bar pattern. A test pattern is located on the under side of the upper cover.
2. Adjustment procedure:

The adjustment must be performed by monitoring either the red or infrared amplifier output while the black and white pattern is being scanned. Since the probe is hand-held, the TSR must attempt to keep the scan speed and pen angle as uniform as possible in order to achieve satisfactory results. A circular scanning motion while holding the probe approximately ten degrees from perpendicular is recommended.

- a. Red Signal Adjustment (Initial)
  1. Set the VOM to the 10 volts AC range.
  2. Place the 0.1  $\mu$ f capacitor in series with the positive meter lead.
  3. Connect the positive lead of the meter to the red signal test point (fig. F-1, red terminal). Connect the negative lead to circuit ground.
  4. Scan the black and white bar pattern and adjust R6 to get a reading of 3 volts.
- b. Infrared Signal Adjustment (Initial)
  1. Set the VOM to the 10 volts AC range.
  2. Place the 0.1  $\mu$ f capacitor in series with the positive meter lead.
  3. Connect the positive meter lead to the infrared signal test point (yellow terminal). Connect negative lead to circuit ground.

4. Scan the bar pattern and adjust R5 to get a reading of 3 volts.
- c. Infrared Adjustment
1. Set the VOM to the negative 10 volts DC range.
  2. Begin scanning pattern and connect the positive meter lead to the infrared negative peak detector test point (white terminal), and the negative lead to circuit ground.
  3. Adjust R5 to achieve a meter reading between -3.5 volts and -4.5 volts.
- d. Red Adjustment
1. Set the VOM to the 10 volts AC range.
  2. Place the 0.1  $\mu$ f capacitor in series with the positive meter lead.
  3. Connect the positive lead to the red and infrared comparator output test point (green terminal). Connect the negative lead to circuit ground.
  4. Scan the bar pattern and adjust R6 to achieve a minimum meter reading. Switch the meter to smaller voltage ranges when adjusting to a minimum.
- e. Repeat steps c and d until a proper meter reading is obtained at the white terminal with a minimum reading at the green terminal.

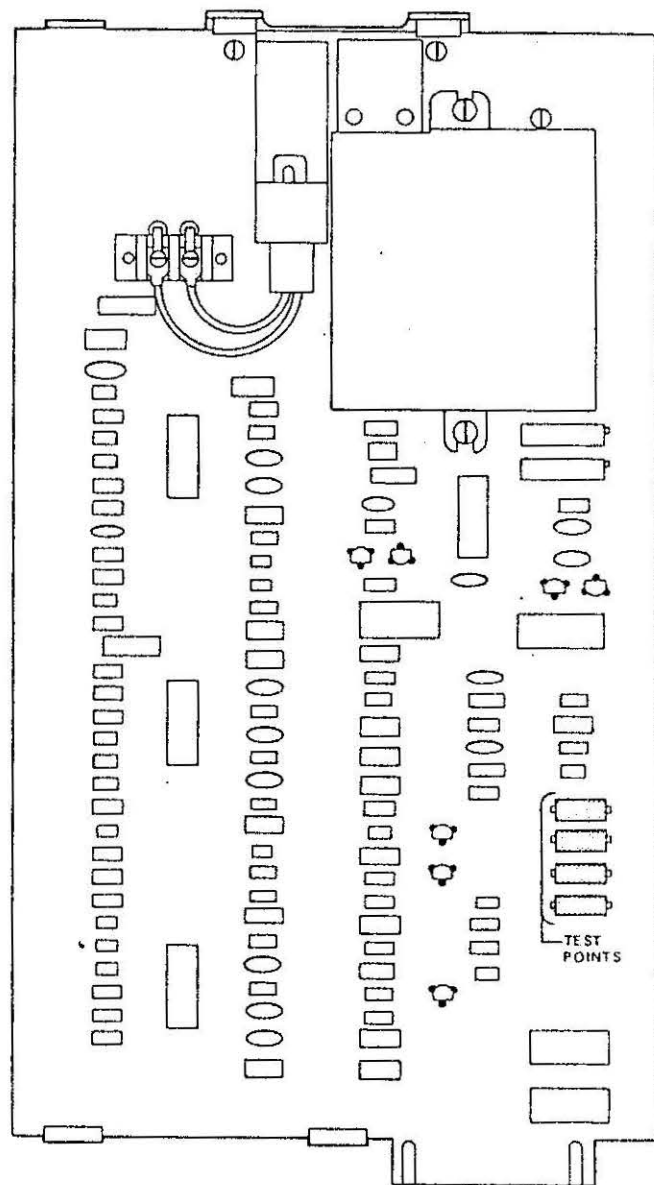


Fig. F-1 Pen decode board